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A REVISION OF THE NEOTROPICAL CATFISHES OF THE FAMILY CALLICHTHYIDAE

By William A. Gosline

INTRODUCTION

The Callichthyidae are distinguishable externally from all other catfishes the presence of two longitudinal rows of plates completely covering the sides d by a pair of barbels originating at each rictus, i.e., the junction of the ps at either end of the mouth.

The group was first recognized as a family by Gill in 1874 and was defined d revised in its entirety by Eigenmann and Eigenmann in 1890. Ellis (1913) ain takes up the group as a whole. The most important papers dealing with the nily in part are the following: Cope (1872 and 1878) in his reports on fishes om the Upper Amazon; Regan (1912) in a revision of the genus *Corydoras*; and randa Ribeiro (1911) in his work on the catfishes of Brazil.

As there is considerable interest in this family, particularly among aqua- sts, it seems advisable at this time to revise and supplement the work of older thors. This is particularly true of the genera and species described by Cope, these have always remained of dubious identity. Furthermore, since Ellis's per in 1913, eleven more species have been described. To these again three are ded in the present paper.

It is perhaps worth calling attention at this point to some of the more portant papers concerned with aspects other than the taxonomy of the Callich- yidae. Regan (1911) has dealt with the general osteology of the group. Hertwig 876) and Leege (1922) have made extensive studies of the external skeleton. elden (1937) has taken up the osteology and myology of the pelvic girdle. The ysiology of respiration has been investigated in two papers, one, by Carter i Beadle (1931), dealing chiefly with respiratory adaptations, and the other, Willmer (1934), primarily with the respiratory function of the blood. The eeding habits and life history of Callichthyids have been extensively dis- ssed by Gill (1907). For the abundant aquarium literature, summaries may be und in Arnold and Ahl (1936), Holly, Meinken, and Rachow (1934 to date), Innes 935), and Stoye (1935). Finally, the fossil record of this family consists of single specimen of *Corydoras* described by Cockerell (1925).

The present revision is based principally on the Stanford collections, rticularly those made by Mr. W. G. Scherer about Pevas, at the mouth of the Am- yacu (spelled Ambyiacu by Cope), a smaller northern tributary of the Peruvian

Table 1. Comparison of generic characters

Genus	Head form	Fontanel	Form of caudal	Lower lip	Nuchal plates	Expansion of coracoids on abdomen	Placement of eye	Rictal barbels	Posterior edge of occipital	Number of dorsal rays
Callichthys	flat	round	round	with fleshy flaps	fused	none	superior	long	truncate	7-8
Hoplosternum	depressed	round or elongate	round or forked	with fleshy flaps	fused	expanded	superior	long	truncate	7-8
Cascadura	depressed	elongate	?	?	not meeting	none	superior	long	?	8
Dianema	depressed	elongate	forked	with 2-4 pairs of barbels	fused	expanded	lateral	long	truncate	7-8
Cataphractops	depressed	elongate	forked	?	not meeting	some	lateral	long	somewhat extended	7
Aspidoras	compressed	round	forked	with one pair of barbels	meeting	none	superior	short	somewhat extended	7
Corydoras	compressed	elongate	forked	with one pair of barbels	not meeting	variable	superior	short	with a projection	7-8 (9?)
Brochis	compressed	elongate	forked	with one pair of barbels	not meeting	expanded	superior	short	with a projection	10-12

zon east of Iquitos. These have been supplemented by loans from the Carnegie seum through the kindness of Dr. A. W. Henn and Mr. M. Graham Netting. I am so indebted to Mr. Fowler for permission to examine Cope's valuable Amazonian ecimens in the Philadelphia Academy of Natural Sciences and to Mr. W. C. roeder for similar permission to examine material in the Museum of Comparative ology at Cambridge as well as for the loan of specimens. Mr. H. W. Clark has so kindly allowed me access to the California Academy of Sciences collections several occasions, and Dr. Paulo de Miranda Ribeiro has obligingly reexamined r me the type of *Hoplosternum schreineri*. Finally, I must thank Miss Margaret orey for reading proof, Prof. G. F. Ferris for making the drawings of the lip rbels, and Prof. G. S. Myers for help and advice throughout.

Concerning the mechanics of the paper, it should be stated that parenthes are never used surrounding authors' names following the names of species. This in accordance with the policy of the Museum of Vertebrate Zoology of the Uniersity of California, the Field Museum of Natural History, and the discussions at e 1939 meetings of the American Society of Ichthyologists and Herpetologists. l numbers of specimens listed are catalogue numbers of the Stanford ichthyological collection. All Callichthyids in this collection have been recorded in the per. All body lengths are standard lengths, measured from the tip of the snout the posterior end of the junction of the upper and lower lateral scutes. All lor descriptions are of specimens now preserved in alcohol. In specific synonyes, many of the invalid species described by older authors have been omitted they have almost always been given by Eigenmann and Eigenmann (1890).

RELATIONSHIPS

As a family the Callichthyidae are quite distinct from the other catfish oups, and their relationship and descent are unknown. Bridge and Haddon (1893) their work on the siluroid Weberian apparatus seem to be in accord with Reisser's earlier suggestion (1859) that the Callichthyids are most closely related the Loricariids. Regan (1911), whose paper on the comparative osteology of e various catfish groups is the most extensive to date, makes no conjecture on e subject.

Within the family the Callichthyids form a rather narrowly circumscribed oup. All are about equally specialized, having the plates of the head and body d the pairs of rictal barbels well developed and of nearly the same form. The inor but apparently constant characters in which the genera of the family differ om one another are given in table I. In working with these fishes it becomes at ce apparent that the family may be split into three groups of genera: the first ontaining *Callichthys*, *Hoplosternum*, and *Cascadura*; the second *Cataphractops* and *ianema*; and the last *Aspidoras*, *Corydoras*, and *Brochis*. These three groups are robably best distinguished by the character of the lower lip as shown in figures , 2, and 3. Though each of these lip forms is undoubtedly constant within its roup of genera, the lip structure cannot be used as a key character since it is nknown to me in *Cataphractops* and *Cascadura*.

To work out the phylogenetic relationships of these groups one to another, t becomes necessary to decide which of the differing characters are primitive. hese I should assume to be: (a) nuchal plates not meeting along the midline between the occipital and the dorsal, (b) supraoccipital not produced, (c) coraoids not expanded on the abdomen, (d) lower lip not developing barbels, and (e)

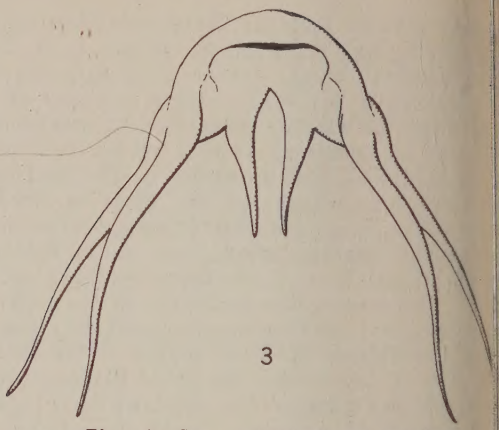

Fig. 3. Same of *Corydoras acutus*. (*Aspidoras* and *Brochis* are similar.)

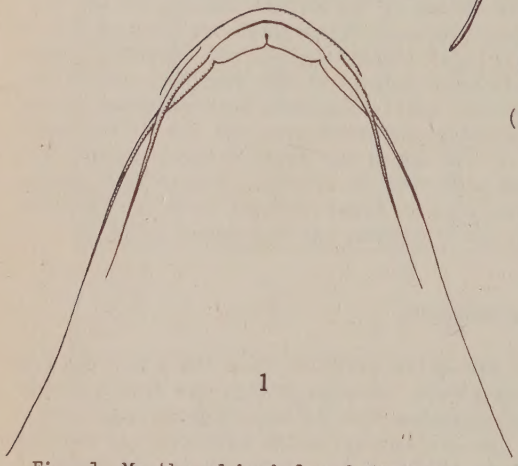

Fig. 1. Mouth and barbels of *Hoplosternum littorale* from below. (*Callichthys* is similar.)

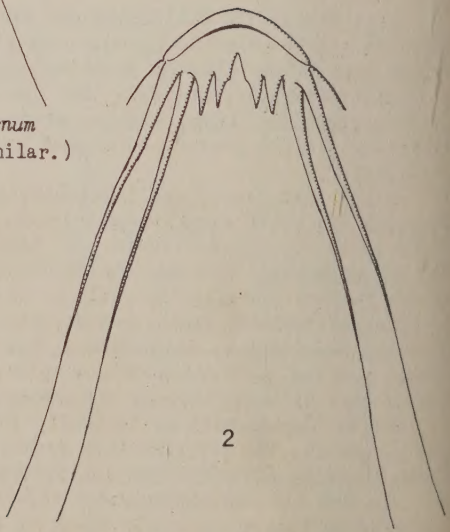

Fig. 2. Same of *Dianema longibarbis*. (*Cataphractops* is probably similar.)

eyes superior. *Cascadura* fulfills these conditions. Starting then with *Cascadura*, a phylogenetic tree for the Callichthyids might be constructed as in figure 4.

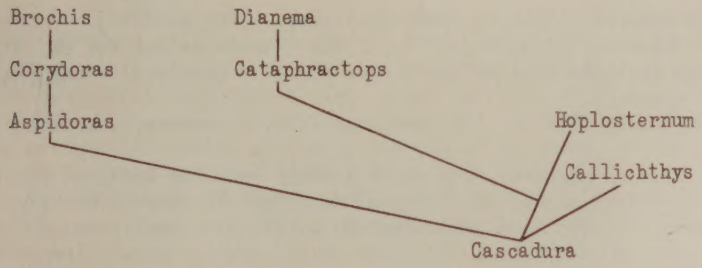

Fig. 4. Possible phylogenetic arrangement of the genera of Callichthyidae.

KEY TO THE GENERA

1a. Snout depressed, the interorbital width greater than or equal to the depth of the head at the forward margin of the orbit.
2a. Eye more or less superiorly situated, i.e., not equally visible from above and below, its diameter contained two or more times in its distance from the lower end of the bony opercle.
3a. Foremost plates of the upper lateral series, i.e., nuchal plates, fused across the midline between the supraoccipital and the dorsal.
4a. Abdomen between the pectoral fins completely covered with flesh; suborbital covered with flesh.....1. *Callichthys*.
4b. Coracoids expanded on the surface of the abdomen between the bases of the pectorals; suborbital bones not covered with flesh.....2. *Hoplosternum*.
3b. Nuchal plates not meeting along the mid-dorsal line; coracoids expanded on the surface of the abdomen between the pectoral bases; eye contained 3.8 in the interorbital.....3. *Cascadura*.
2b. Eye laterally situated, i.e., equally visible from above and below, its diameter contained 1.3 times or less in its distance from lower end of bony opercle.
5a. Foremost plates of upper lateral series, i.e., nuchal plates, fused across the midline between the occipital and the dorsal.....4. *Dianema*.
5b. Nuchal plates not meeting along the mid-dorsal line.....5. *Cataphractops*.
1b. Snout compressed or rounded, the irterorbital width considerably less than the depth of head at the forward rim of orbit; barbels at either end of the mouth, i.e., rictal barbels, not reaching much beyond gill opening; lower lips reverted to form a single pair of short barbels.
6a. Foremost plates of upper lateral series, i.e., nuchal plates, meeting along the midline betwéen occipital and dorsal; abdomen between pectoral bases entirely covered with flesh; fontanel small, roundish.....6. *Aspidoras*.
6b. Nuchal plates not meeting along the mid-dorsal line; coracoids usually more or less expanded on the abdomen between pectoral bases; fontanel elongate.
7a. Dorsal fin with a spine and seven or eight, possibly nine, rays.....7. *Corydoras*.
7b. Dorsal fin with a spine and ten to twelve rays.....8. *Brochis*.

I. Genus *CALLICHTHYS* Scopoli

[*Callichthys* Linnaeus, 1749, p. 599; Gronovius, 1763, p. 127.]
Calichthys (Gronovius) Scopoli, 1777, p. 451 (lapsus calami for *Callichthys*; genotype by monotypy *Callichthys cirris quattuor* Gronovius = *Callichthys callichthys* Linnaeus).
Cataphractus Bloch, 1794, p. 180 (preoccupied by *Cataphractus* Meuschen, 1778).

Head broad, depressed, its width greater than the depth of the body. Lowe lip reverted to form a pair of fleshy flaps (fig. 1). Rictal barbels reaching t midway between the pectoral and ventral bases. Eye small, superiorly placed Suborbital covered with flesh. Fontanel small, nearly round. Supraoccipital no forming a backward extension. Nuchal plates fusing along the midline betwee the supraoccipital and the dorsal. Abdomen between pectoral fins completel covered with flesh. Azygous predorsal plate lacking. Dorsal I, 7 or I, 8, th length of its base contained twice or more in its distance from the adipose Caudal rounded. One species.

1. *Callichthys callichthys* Linnaeus

Silurus callichthys Linnaeus, 1758, p. 307 (America).
Callichthys callichthys Eigenmann and Eigenmann, 1890, p. 452 (Pernambuco; Juiz de Fora; Rio Janeiro; Bahia; Mendez; Macacos; Porto Seguro; Surinam).

Stanford 21981, one, 70 mm, Kumaka, British Guiana, 1908, Eigenmann 22160, three, 120-143 mm, Pará, 1911, E. C. Starks; 35051, two, 93 and 132 mm vicinity of Buenos Aires, 1934, A. W. Herre; 33324, one, 61 mm, vicinity of Pevas Peru, 1937, W. G. Scherer; 33274, one, 72 mm, vicinity of Pevas, Peru, Feb. 24 1937, W. G. Scherer; 33273, one, 65 mm, vicinity of Pevas, Peru, June 6, 1937 W. G. Scherer.

This species is the most wide-ranging of the Callichthyidae, having bee taken from Trinidad in the north to Buenos Aires in the south and from the upper Amazon and Paraguay systems to the coastal streams of Brazil.

II. Genus *HOPLOSTERNUM* Gill

Hoplosternum Gill, 1858, p. 395 (genotype by original designation *Callichthys laevigatus* Valenciennes = *Hoplosternum littorale* Hancock).
Hoplosternon Bleeker, 1862a, p. 391 (emendation for *Hoplosternum* Gill).

Head depressed, its width equal to the width of body or less. Lower lip reverted to form a pair of fleshy flaps (fig. 1). Rictal barbels reaching to midway between pectoral and ventral bases or beyond. Eye more or less superiorily placed. Suborbital naked. Fontanel rounded or elongate. Supraoccipital not forming a backward extension. Nuchal plates fusing along the midline between the supraoccipital and dorsal. Abdomen between pectoral fins enclosed wholly or in part by expansions of the coracoids. Azygous predorsal plate lacking. Dorsal I, 7 or I, 8, the length of its base contained slightly more than once in its distance from the adipose. Caudal rounded or emarginate. Probably two species; Panama and Trinidad, east of the Andes and south to the La Plata.

KEY TO THE SPECIES

a. Azygous, i.e., median, pre-adipose scutes extending two-thirds of the way or less forward to the dorsal; postorbital a weak vertical rod; no platelet below anterior scute of upper lateral series; all caudal rays of approximately the same thickness; body, dorsal and caudal spotted..... .....1. *Hoplosternum thoracatum.*

b. Azygous pre-adipose scutes extending the entire distance between adipose and dorsal; postorbital well developed, longer than deep; a roundish platelet below the anterior scute of the upper lateral series; outer caudal rays considerably thickened; body, dorsal and caudal plain....2. *Hoplosternum littorale.*

1. *Hoplosternum thoracatum* Cuvier and Valenciennes

This species may apparently be divided into the two following subspecies:

1a. *Hoplosternum thoracatum thoracatum* Cuvier and Valenciennes

allichthys thoracatus Cuvier and Valenciennes, 1840, p. 309, pl. 443 (Mana, Martinique; evidently in error).
allichthys pectoralis Boulenger, 1895, p. 525 (Monte Sociedad, Paraguayan Chaco); Boulenger, 1896, p. 29, pl. 4, fig. 4 (Monte Sociedad, Paraguayan Chaco).
oplosternum orinocoi Fowler, 1915, p. 229, fig. 8 (La Pedrita, Orinoco Delta).

Stanford 21850, two, 54 and 55 mm, Gluck Island, British Guiana, 1908, Eigenmann; 22156, 112 and 126 mm, Pará, 1911, E. C. Starks; 22163, eight, 107-127 mm, Lake Papary, State of Rio Grande do Norte, Brazil, 1911, E. C. Starks; 33275-33278, four, 62-80 mm, vicinity of Pevas, Peru, 1936, W. G. Scherer; 35052, one, 49 mm, aquarium specimen. Specimens from the Orinoco in the collections of the California Academy have also been examined.

This fish is extremely variable in many of its characters, such as the degree of expansion of the coracoids on the abdomen, the shape of the fontanel, the form of the occipital and nuchal plates, the length of the barbels, and the shape and markings of the caudal. Its range so far as recorded extends from the Orinoco to the upper Paraguay and along the east coast as far south as Pernambuco.

1b. *Hoplosternum thoracatum magdalenae* Eigenmann

Callichthys (Hoplosternum) thoracatum Steindachner, 1880, p. 14 (Rio Cauca near Caceres, Colombia).
Hoplosternum magdalenae Eigenmann, in Ellis, 1913, p. 412 (Soplaviento and Calamar Cienega, Colombia); Eigenmann, 1922, p. 65, pl. 8, figs. 2-4 (Magdalena basin and Rio Truando, Colombia).
Hoplosternum punctatum Meek and Hildebrand, 1916, p. 264, pls. 14 and 15 (Rio Marte Arnade, 6 miles east of Panama City, Panama).

So far as I have been able to determine from existing descriptions, this subspecies differs from the typical form chiefly in having a more forked caudal. Its range is limited to the area between Panama on the west and the Magdalena drainage on the east.

2. *Hoplosternum littorale* Hancock

Callichthys littoralis Hancock, 1828, p. 244 (Demerara, British Guiana).
Hoplostèrnum littorale Eigenmann and Eigenmann, 1890, p. 456 (Surinam; Amazon).
Hoplosternum schreineri Miranda Ribeiro, 1911, p. 150, pl. 35, fig. 3 (Pará).
Hoplosternum shirui Fowler, 1940, p. 233, figs. 18, 19, and 20 on p. 229 (Rio Ucayali, Peru).

Stanford 21869, one, 128 mm, Georgetown, British Guiana, 1908, Eigenmann; 31584, twenty-two, 65-137 mm, San Pedro, Argentina, June, 1934, A. W. Herre; 33279 and 33280, two, 139 and 159 mm, Pevas district, Peru, Sept., 1937, W. G. Scherer.

This widely distributed and variable species is found from Trinidad to Rio de Janeiro, but is apparently absent from the coastal streams of Brazil.

III. Genus *CASCADURA* Ellis

Cascadura Ellis, 1913, p. 387 (genotype by monotypy *Cascadura maculocephala* Ellis).
Ellisiohthys Miranda Ribeiro, 1920, p. 11 (an invalid substitution for *Cascadura* Ellis, which is considered a barbaric name).

Snout depressed, body compressed. Eye more or less superior. Fontanel elongate. Rictal barbels reaching slightly beyond the base of the ventrals. Process of supraoccipital not meeting the azygous predorsal plate. Nuchal plates not meeting along the midline between the supraoccipital and the dorsal. Abdomen between the pectoral fins completely covered with flesh. Dorsal I, 8, its base equal to its distance from the supraoccipital. One species.

1. *Cascadura maculocephala* Ellis

Cascadura maculocephala Ellis, 1913, p. 387, pl. 25, fig. 3 (Uruguayana, Rio Uruguay).

This species is known only from a single specimen in the Carnegie Museum, Pittsburgh. I have not seen it.

IV. Genus *CATAPHRACTOPS* Fowler

Cataphractops Fowler, 1915, p. 231 (as a subgenus; genotype by original designation *Callichthys melampterus* Cope).

Snout depressed, body compressed. Eye large, lateral. Rictal barbels long, reaching to end of ventrals or beyond. Fontanel elongate. Suborbital naked. Supraoccipital forming a short backward projection which does not meet the azygous predorsal plate. Nuchal plates not fusing along the midline between the supraoccipital and the dorsal. Coracoids somewhat exposed on the abdomen between the pectoral fins. Dorsal I, 7, the length of its base somewhat less than its distance from the adipose fin. Caudal rays emarginate, the outermost rays the longest. One species; Rio Ampiyacu, Peru and (?)Pará.

1. *Cataphractops melampterus* Cope

lichthys melampterus Cope, 1872, p. 275, pl. 14, figs. 4 and 5 (Rio Ampiyacu, eru).
losternum melampterum Fowler, 1915, p. 232 (Rio Ampiyacu, Peru).
capogon verissimi Miranda Ribeiro, 1911, p. 154, pl. 36, fig. 1 (Pará).

It is very difficult to tell whether *Decapogon verissimi* is a synonym Cope's species, because Miranda Ribeiro's description is obviously based on specimen in very poor state of preservation. The situation is not clarified the fact that the specimen which Cope and Fowler described is also in poor ndition. Nor are other specimens of what might be considered either or both ecies extant.

V. Genus *DIANEMA* Cope

anema Cope, 1872, p. 276 (genotype by monotypy *Dianema longibarbis* Cope).
capogon Eigenmann and Eigenmann, 1888, p. 165 (genotype by original designation *Callichthys adspersus* Steindachner).

Head somewhat depressed, its width much less than depth of body. Lower p forming two to four pairs of short barbels in addition to the rictal barbels ig. 2); latter reaching origin of pectoral or beyond. Suborbital very narrow, ked. Eye large, laterally placed. Fontanel elongate. Supraoccipital not form- g a backward projection. Nuchal plates fusing along the midline between the praoccipital and the dorsal. Abdomen between the pectorals usually completely vered by expansions of the coracoids. Azygous predorsal plate lacking. Dorsal 7 or I, 8, the length of its base contained once to one and a half times in s distance from adipose. Caudal forked. Two species; Amazon.

KEY TO THE SPECIES

.. Caudal plain.....1. *Dianema longibarbis.*
. Caudal with longitudinal black stripes.....2. *Dianema urostriata.*

1. *Dianema longibarbis* Cope

anema longibarbis Cope, 1872, p. 276, pl. 7, fig. 1 (Rio Ampiyacu, Peru).
llichthys adspersus Steindachner, 1877, p. 135 (p. 87 of reprint), pl. 11, fig. 2 (Santarém to Tabatinga; Rio Xingu).
capogon adspersus Eigenmann and Eigenmann, 1888, p. 165 (Cudajas; Tabatinga; Porto do Moz); 1890, p. 461 (Cudajas; Tabatinga; Porto do Moz).

Stanford 33280-33295, 33323, fifty-one, 52-70 mm, vicinity of Pevas, io Ampiyacu, Peru, 1936 and 1937, W. G. Scherer. These examples are topotypic f the species.

Reexamination of Cope's types indicates that the peculiarities in the arbels and snout described and figured in the original account are undoubtedly ue to the decay of the flesh of the face of his specimens.

2. *Dianema urostriata* Miranda Ribeiro

Decapogon urotriatum (misprint for *urostriatum*) Miranda Ribeiro, 1912, p. 15 (Manáos).
Decapogon urostriatum Ellis, 1913, p. 391, pl. 26, fig. 1 (Manáos).

This species is known only from specimens in the museums of Rio de Janei and Pittsburgh.

VI. Genus *ASPIDORAS* von Ihering

Aspidoras von Ihering, 1907, p. 30 (genotype by original designation *Aspidor rochai* von Ihering).

Head compressed. Lower lip reverted to form a single pair of barbels b side the rictal barbels (fig. 3). Rictal barbels reaching about to level of gi opening. Eye more or less superior. Suborbital naked. Fontanel small, roundis its length equal to about half the diameter of the eye. Supraoccipital formi a broad, short triangle posteriorly. Nuchal plates barely meeting along the mi line between the supraoccipital and the azygous predorsal plate. Abdomen betwe pectoral fins completely covered with flesh. Dorsal I, 7, its base somewh shorter than its distance from adipose. Caudal forked. One species; northeaster Brazil.

1. *Aspidoras rochai* von Ihering

Aspidoras rochai von Ihering, 1907, p. 30 (Fortaleza, State of Ceará, Brazil); Ellis, 1913, p. 394, pl. 26, fig. 3 (Rio Agua Branca, Rio Zinga and Rio Paiaia in the upper Rio Itapicurú watershed, state of Bahia, Brazil).

I have examined one of the specimens recorded by Ellis, received on loa from the Carnegie Museum, as well as one from the Rio Paiaia in the Californi Academy of Sciences.

VII. Genus *CORYDORAS* Lacépède

Corydoras Lacépède, 1803, vol. 5, p. 145 (genotype by monotypy *Corydoras geoffroy* = *Corydoras punctatus* Bloch).
Cordorinus Rafinesque-Schmaltz, 1815, p. 89 (emendation for *Corydoras* Lacépède).
Hoplisoma Swainson, 1838, p. 336 (genotype by original designation *Cataphractus punctatus* Bloch).
Hoplosoma Agassiz, 1846, p. 186 (emendation for *Hoplisoma* Swainson).
Scleromystax Günther, 1864, p. 225 (as a subgenus; genotype by monotypy *Callichthys barbatus* Quoy and Gaimard).
Gastrodermus Cope, 1878, p. 681 (genotype by present designation *Corydoras elegans* Steindachner).
Osteogaster Cope, 1894, p. 102 (genotype by original designation *Corydoras eques* Steindachner).

Body and head compressed. Eye more or less superior. Lower lip forming a single pair of short barbels in addition to the rictal barbels (fig. 3); lat-

never reaching much past the level of the gill opening. Fontanel elongate. orbital naked. Supraoccipital forming a process posteriorly which may or may meet the azygous predorsal plate. Nuchal plates never meeting along midsal line. Coracoids exposed on the abdomen between the pectoral fins or not. sal I, 7 or I, 8, its base about equal to its distance from the adipose. Cau- forked. About 33 species; Guiana to the La Plata and west to the Andes.

There are certain nomenclatural and taxonomic difficulties surrounding name *Corydoras* and one of its synonyms, *Scleromystax*. The problems concerning the name *Corydoras* have been dealt with by Professor Myers below.

Those concerning the name *Scleromystax* are simpler, having only to do th the identification of the type species, *Callichthys barbatus* Quoy and Gaird. Miranda Ribeiro (1911) has shown beyond all doubt, by a comparison of scriptions and by collecting at the type locality of *Callichthys barbatus*, at this fish is the same as the one subsequently described by himself (1907) *Corydoras kronei*. The fish which Ellis identifies as *Scleromystax barbatus* not that described by Quoy and Gaimard but rather *Corydoras macropterus* Regan 913).

A NOTE ON THE STATUS OF THE GENERIC NAME *CORYDORAS*

By G. S. Myers

The history and application of the generic name *Corydoras* are badly in ed of clarification. *Corydoras* was erected by Lacépède solely for the reception his new species *C. geoffroy*, from an unknown locality. The species was not gured, the type specimen in Paris had been lost even at the time Valenciennes arched for it, and beyond the fact that the fish was a Callichthyid, its geric and specific placement is now utterly impossible on the basis of Lacépède's neric and specific descriptions. Lacépède's most patent errors are his repeated ntion of two rays in the adipose fin, one anterior and one posterior, and his atement that the fish had no barbels. Cuvier and Valenciennes (1840, p. 321) nt that Lacépède may never have removed the fish from the bottle to describe !

One might be justified in considering the genus *Corydoras* to be unrecogzable, and in discarding the name, if such treatment would not be so calamius. Although the name is a rather obscure one in ichthyology, it is in daily e all over the world by thousands of aquarium enthusiasts, to whom *Corydoras* an extremely well-known genus. It is probable that the name is better known more people than is the generic term *Silurus*! Any attempt to save it is thereore justified.

As a matter of fact, there seems to be very good reason for retaining rydoras. Many of the early descriptions, in all zoological groups, are unrecogzable today, and the names based upon them are accepted chiefly on the basis of ter identifications which have been universally accepted. If no nomenclatural mplications are evident, there is no value in upsetting accepted usage in favor an opinion that can never be certain. *Corydoras* presents such an instance. No e has ever questioned its application, and it has never been used for more than e genus. The following history will make this clear.

Cuvier and Valenciennes (1840) definitely identify *Corydoras geoffroy* th *Cataphractus punctatus* of Bloch, and although it is likely that they took is step merely to get rid of a bothersome name, it can not be proved that they

were wrong, and we are therefore scarcely at liberty to question their identif cation. *C. punctatus*, judging from Bloch's plate, is certainly a member of t group containing *Corydoras* and *Brochis*.

Other than in mere copying of Lacépède, the first subsequent author recognize the name *Corydoras* in a generic or subgeneric sense is Bleeker (1862 p. 4). He differentiates the genus from *Callichthys* and *Hoplosternum*, synonymiz *Hoplisoma* of Swainson with it, and accepts unconditionally the identification Lacépède's with Bloch's species. The patently erroneous use of *Corydoras* by Spi corrected on the same page by Agassiz, is of no importance (see Spix, Agassi and Martius, 1829, p. 14). Following Bleeker, there has never been any questi of the application of *Corydoras*. Every writer who has mentioned it as eith genus or subgenus, including the four revisers of the genus (Günther, 1864; E genmann and Eigenmann, 1890; Regan, 1912; and Ellis, 1913), has accepted *Cor doras* in Bleeker's sense without question, and I see no reason to disturb th arrangement.

It is unfortunate that no recently known species can be certainly ident fied with Bloch's plate of *punctatus*. Eigenmann's (1912) *punctatus* was a compo ite of *melanistius* and *potaroensis*; *punctatus* of Arnold and Ahl (1936) is ce tainly not Bloch's fish, and may again be *melanistius*. Both Bloch and Lacépè give nine soft dorsal rays for their species, a number unknown for any simil Callichthyid save *Callichthys splendens* Castelnau, which also is known only fr the poor original description and plate. Castelnau gave no fin counts and we mus accept his plate, which does not appear to be carefully done. It seems peculia that the only three Callichthyids ever reported to have nine soft dorsal ra (*Corydoras geoffroy* Lacépède, *Cataphractus punctatus* Bloch, and *Callichth splendens* Castelnau) are known only from old accounts, and that no modern spec mens of any of them have appeared. Personally, I am inclined to believe tha these fin counts, in old papers done by notoriously careless authors, are erro neous. Bloch's plate shows a fish with a dorsal fin of short basal length, and i can not possibly be mistaken for anything but a *Corydoras*, in the sense in whic that genus is nowadays delimited. It is, in fact, very similar in appearance t certain species such as *melanistius* and *ambiacus* except in the absence of smal spots on the fins and body and the position of the dorsal blotch. It is to b noted that the spots (bars) of the caudal and on the body of *melanistius* fade i alcohol and that Regan described this fish, which has striking bars on the caud in life, as having the caudal plain.

To my mind, there is no doubt that Bloch's *punctatus* is a *Corydoras* an not a *Brochis*, but Mr. Gosline has emended the definition of *Corydoras* to includ fishes with nine soft dorsal rays, in order definitely to include Bloch's an Lacépède's counts. It may be emphasized again that no recently recognized specie with nine soft rays is known.

To sum up, it is now impossible to question the acts of Cuvier and Valen ciennes and of Bleeker in identifying *Corydoras geoffroy* Lacépède with *Cataphrac tus punctatus* Bloch. Bloch's plate plainly represents a *Corydoras* as that genus is now understood. Therefore *geoffroy* = *punctatus* is the genotype (by monotypy of *Corydoras*, and this generic name may continue to be used for the group to which it has been applied by all authors since Bleeker.

KEY TO THE SPECIES OF *CORYDORAS*

Snout long, its profile straight or concave; bony interorbital contained 1.7 or more times in snout.
24 or 25 scutes in upper lateral series; adult males with bristles on lower part of cheek.....1. *C. barbatus.*
22 or 23 scutes in upper lateral series; no bristles on cheek.
.. Bony interorbital contained more than twice in snout; caudal plain.....
.....2. *C. treitlii.*
. Bony interorbital contained less than twice in snout; caudal barred.
a. Width of body contained more than 1.5 times in depth; sides with several series of small spots.....3. *C. acutus.*
b. Width of body contained 1.4 times or less in the depth; sides of body in the adult without small spots.
5a. Sides of the body in the adult without well-defined markings; anal and posterior of dorsal usually with a few small spots.....4. *C. spilurus.*
5b. Sides of body in the adult with striking black blotches; anal and posterior rays of dorsal plain.
6a. Posterior dark blotch extending vertically across caudal peduncle just ahead of caudal fin; interorbital 2.6-3.3 in head; habitat: northern Venezuela.....5. *C. septentrionalis.*
6b. Posterior dark blotch below adipose; interorbital contained 3.2-3.3 in head; habitat: Sapucay, Paraguay.....6. *C. ellisae.*
Snout short, its profile rounded or sometimes nearly straight; bony interorbital contained 1.4 or less in snout.
An intense, black, hastate spot at base of caudal.....7. *C. hastatus.*
No black, hastate spot at base of caudal.
a. Width of naked area on breast between coracoids less than the diameter of the eye in width.
a. Suborbital covering entire cheek.....8. *C. eques.*
b. Suborbital covering only a small part of cheek, its depth less than the diameter of the eye.....9. *C. elegans.*
. Width of naked area between coracoids greater than the diameter of the eye.
10a. Coracoids completely surrounding the pectoral bases on the surface of the body; distance between nares contained 2.6 times in the interorbital; flesh of abdomen with small platelets.....10. *C. ambiacus.*
10b. Coracoids incompletely surrounding pectoral bases on the surface of the body.
11a. Dorsal spine very long, reaching adipose when laid back..11. *C. armatus.*
11b. Dorsal spine not reaching adipose when laid back.
12a. Depth of suborbital in the adult equal to or greater than the diameter of the eye; dorsal spine short, about equal to the length of the snout .....12. *C. aeneus.*
12b. Depth of the suborbital in the adult less than the diameter of the eye.
13a. Sides of body with a trilineate pattern formed of a dark band along the junction of the rows of lateral scutes bordered on either side by a lighter band, these lighter bands in turn delimited above and below by the darker pigmentation of the sides.
14a. Flesh of abdomen without small platelets; dorsal without a black blotch; caudal plain.....13. *C. bondi.*

14b. Flesh of abdomen usually with small platelets; dorsal with a black blotch; caudal barred.....14. *C. julii*

13b. Sides of body without a trilineate pattern.

15a. Caudal barred (except in some specimens of *C. melanistius* and *C. paleatus*); sides of body usually with spots or blotches.

16a. Head contained 3.5 or less in standard length.

17a. Sides of body plain except for a single dark line along the junction of the scutes and a series of minute black dots at the base of the dorsal fin; head and fins, except ventrals, spotted; a blac blotch on the forward distal part of the dorsal fin; a second blotch on the adipose; caudal with about seven vertical bars.....15. *C. punctatus*

17b. Sides with spots or blotches; no band along junction of rows of scutes.

18a. Dorsal blotched or banded; depth contained 2.5 or more in the standard length.

19a. Depth 3.0 to 4.0 in standard length; 23-25 scutes in upper lateral series; eye 5-6 in head; dorsal with a band.....16. *C. raimundi*

19b. Depth 3 or less in standard length; 21-24 scutes in upper lateral series; eye 5 or less in head; dorsal blotched.

20a. Dorsal spine about equal to the length of head; sides of body with many small dark punctulations but without blotches; a more or less well-defined vertical band from top of head through eye.....17. *C. melanistius*

20b. Dorsal spine about $\frac{2}{3}$ the length of head; sides of body with dar blotches but without small dark spots; no black mask over eye.

21a. Head 3.3-3.5 in standard length; dorsal with at least two blotches or spots; 22-24 scutes in upper lateral series.....18. *C. paleatus*

21b. Head 3 in standard length; dorsal with a single dark blotch.....19. *C. garbei*

18b. Dorsal punctulate; sides punctulate, without blotches; depth 2.4 in standard length.....20. *C. multimaculatus*

16b. Head contained 3.75-4 in standard length.

22a. Eye 5 or less in head; 22-23 scutes in upper lateral series.

23a. Sides of body plain.....21. *C. aurofrenatus*

23b. Sides of body with spots and blotches.....22. *C. microcephalus*

22b. Eye 6-7 in head; 25 scutes in upper lateral series.....23. *C. micracanthus*

15b. Caudal plain; sides of body usually without spots or blotches.

24a. Dorsal profile forming nearly a straight line from tip of snout to dorsal; length of head nearly equal to depth of body; occipital process not quite meeting the azygous predorsal plate; skin of abdomen granular.....24. *C. melanotaenia*

24b. Dorsal profile more or less rounded over the snout; occipital process meeting the azygous predorsal plate; skin of abdomen not granular.

25a. Adult males with bristles on the lower part of cheek and with dorsal and anal elongate; depth of body 3.2-3.5 in standard length; diameter of eye contained more than twice in interorbital.....25. *C. macropterus*

25b. Adult males without either bristles on cheek or elongate dorsal and anal fins; depth of body 3 or less in standard length.
26a. An arcuate black band along dorsal part of body to caudal base.
27a. Black band beginning on snout, continued through eye, following but not involving the dorsal contour, and ending at the lower end of caudal base.....26. *C. arcuatus.*
27b. A vertical black band through eye; lateral black band not extending forward of dorsal fin.
28a. Most of dorsal fin black; lateral band involving the dorsum and adipose fin and curving downward posteriorly along caudal base.. .....27. *C. metae.*
28b. Only the base of dorsal fin black; lateral band not involving the adipose, extending in an approximately straight line from front of dorsal on to bases of lower caudal rays.....28. *C. melini.*
26b. No arcuate black band along upper half of body.
29a. A black stripe extending vertically from top of head through eye; most of dorsal fin black.....29. *C. potaroensis.*
29b. No vertical black stripe through eye; dorsal fin without a dark blotch.
30a. Dorsal spine short, contained 1.5-1.7 in head.
31a. Eye contained 1.8 or less in interorbital; a dark median stripe along sides.....30. *C. nattereri.*
31b. Eye contained 2.3-2.5 in interorbital.....31. *C. microps.*
30b. Dorsal spine long, contained 1.2 in head.
32a. A dark median stripe along sides; sides of body without small dark spots.....32. *C. latus.*
32b. No dark median stripe; sides of body with many small dark spots .....33. *C. polystictus.*

1. *Corydoras barbatus* Quoy and Gaimard

ichthys barbatus Quoy and Gaimard, 1824, p. 234 (Rio de Janeiro).
doras kronei Miranda Ribeiro, 1907, p. 189, fig. c; Ellis, 1913, p. 409, pl. , fig. 3 and pl. 29, figs. 1-3 (twelve localities in southeastern Brazil).
doras eigenmanni von Ihering, 1907, p. 34 (Cubatão and Raiz de Serra, State São Paulo, Brazil).
doras barbatus Miranda Ribeiro, 1912, p. 168 (Iporanga, Rio Ribeira, State São Paulo, Brazil).

Stanford 31582, numerous specimens, 20-65 mm, Santos, Brazil, June, 1934, . Herre; 35053, thirty-eight, 19-55 mm, aquarium specimens.

This species and *Corydoras macropterus* are the only species of Callichthyin which the adult males have bristles on the lower part of the cheek, toer with an elongation of the dorsal and pectoral fins.

2. *Corydoras treitlii* Steindachner

doras treitlii Steindachner, 1906, p. 478 (Rio Parnahyba at Victoria, State Maranhão, Brazil).

Stanford 35054, one, 44 mm, aquarium specimen.

3. *Corydoras acutus* Cope

Corydoras acutus Cope, 1872, p. 281 (Rio Ampiyacu, Peru).

Stanford 33305-33315, 33363, twelve, 42-55 mm, Pevas district, Ampiya River, Peru, 1936 and 1937, W. G. Scherer.

Body and head compressed throughout, the width about 4.1 in standa length, the depth 2.4-2.7. Scutes 22/21, completely enclosing body between dors and adipose dorsally and between anus and anal ventrally. Shields at base of pe torals incompletely enclosing the base of the fin forward at the surface, al leaving a fleshy area about the width of the eye between them in the mid-ventr line. Head to the upper angle of gill opening 3 (in the smallest) to 3.3 (in t largest) in standard length, its dorsal profile forming an angle in front of t eye. Snout 1.5-1.9 in head; interorbital 2.7-3.1, orbit 3.7 (in the smallest) 4.4 (in the largest). Rictal barbels reaching slightly beyond eye. Suborbit bony encasement narrow, followed below by a fleshy cheek about twice the wid of the bony area. Dorsal I, 7, the spine shorter than the first rays and contain 1.4-1.5 times in head. Adipose spine and membrane well developed, preceded 2 or 3 azygous pre-adipose scutes. Pectoral I, 9, the spine shorter than the ra and contained 1.2-1.4 times in head. Caudal forked, the upper lobe the longe Basic body color yellow, with a vertical brown band on each scute which usual breaks up to form spots. Top of head with brownish mottlings. Dorsal with a da blotch at the tips of the first rays (sometimes absent). Caudal barred, the upp lobe with as many as 11 vertical bars.

These specimens disagree with Cope's description in the presence of a gous pre-adipose scutes and in the greater number of pectoral rays. In goi through Cope's material in the Philadelphia Academy, Cope's specimens of th species were not found.

4. *Corydoras spilurus* Norman

Corydoras spilurus Norman, 1926, p. 95 (Approuague River, French Guiana).

5. *Corydoras septentrionalis*, new species

Holotype: Stanford 35055, 47.5 mm, Rio Piña, north of Maturin, Venezuel March 18, 1939, F. F. Bond.

Paratypes: Stanford 35056, fourteen, 23-49 mm, Rio Piña, north of Maturi Venezuela, March 18, 1939, F. F. Bond; 35058, six, 34-41 mm, Rio Guanipa, nor of El Tigre, Venezuela, March 16, 1939, F. F. Bond.

Stanford 35057, one, 28 mm, Rio Amana, east of Santa Barbara, Venezuela March 16, 1939, F. F. Bond; 35059, one, 37 mm, Rio Tinaquillo at Tinaquillo, Ven ezuela, March 9, 1939, F. F. Bond.

In the following description measurements for the type stand first; meas urements for ten other specimens 34.5-49 mm in standard length follow in paren theses.

An elongate, compressed species. Depth contained 2.9 (2.7-3.1) in standa length; width 3.9 (3.6-4.2), head to upper angle of gill opening 3.2 (3.0-3.4) distance from snout to dorsal spine 1.9 (1.9-2.1). Depth of caudal peduncle con tained 2.5 (2.1-2.8) in depth of body. Lateral scutes 23-22/21-20. Usually thre

gous plates preceding adipose, four in two specimens. Pores of lateral line nding to fourth or fifth lateral scute. Lower lateral scutes and coracoid esses leaving a moderately naked area between them, which is not covered with l platelets.

Snout rather narrow, elongate, its profile slightly concave. Snout con- ed 1.6 (1.5-1.8) in head; interorbital 2.9 (2.6-3.3); eye 4.7 (4.0-4.7); orbital area of head to upper angle of gill opening 4 (3.5-4.2). Width of rbital equal to slightly less than half the diameter of the eye. Opercular h contained 2 (1.6-2) in its depth. Fontanel narrow, elongate; reaching for- i to slightly in front of center of eye, posteriorly almost to beginning of raoccipital process. Occipital process rather narrowly triangular, meeting, apparently passing under, the azygous predorsal scute which is somewhat long- than the occipital process. Rictal barbels not quite reaching gill opening.

Dorsal fin with I,7, less commonly I,8, rays, the spine contained 1.5 3-1.6) in the length of the head. First three dorsal rays longer than spine. sal base about equal to its distance from adipose. Caudal deeply cleft, its dle rays slightly less than half the length of outer rays. Both caudal lobes ut equal, their length about 1.2 times the length of the head. Anal I,6. Pec- al I,9, the spine contained 1.4 (1.2-1.4) in length of head, its base incom- tely surrounded by the coracoid process.

Color yellow-brown above to yellow beneath. A large dark blotch on the es extending from slightly in front of dorsal nearly to adipose, tapering off teriorly, a second, less intense, on caudal peduncle. Dorsal, anal, and paired s immaculate. Caudal with five to seven vertical bars, most intense on the ge of lower caudal lobe.

Specimens from the Rio Guanipe differ from those of the Rio Piña in a dency to have I,8 instead of I,7 dorsal rays and 22/20 rather than 23/21 lat- l scutes. The coloration is also much lighter, the forward black blotch being ited to an oblique stripe extending downward and backward from the nape just ad of the dorsal to slightly below the lateral line. The blotch on the caudal duncle is also less intense.

Corydoras septentrionalis very closely resembles both *spilurus* and *elli-*. For a comparison with the latter see under the description of that species. m Norman's description of *spilurus*, *septentrionalis* can be distinguished only coloration, the latter fish having two well-marked dark blotches (which may ge) on the sides instead of "young specimens with irregular series of dark ts and blotches on side, which disappear almost completely in adults." *C. sep- trionalis* also never has the "few small spots on posterior rays of dorsal and the anal fin" mentioned as generally the case in *C. spilurus*.

6. *Corydoras ellisae*, new species

rydoras flaveolus (nec von Ihering) Ellis, 1913, p. 407, pl. 28, fig. 1 (Sap- ucay, Paraguay).

Holotype: Carnegie Museum 3522, 48 mm, Arroyo Poná, Sapucay, Paraguay, ril 5, 1909, J. D. Haseman.

Paratype: Carnegie Museum 3521, 47 mm, mountain rills near Sapucay, Para- ay, April 2, 1909, J. D. Haseman.

In the following description figures for the holotype are given first; ose for the paratype follow in parentheses.

Depth contained 2.9 (2.9) in standard length; width 4 (3.9), head to upp angle of gill opening 3.2 (3.0), distance from snout to dorsal spine 2.0 (2.(Depth of caudal peduncle 2.7 (2.5) in depth of body. Lateral scutes 22/20; thr azygous scutes before adipose. Pores of lateral line inconspicuous, extending fourth lateral scute. Coracoid processes and lower lateral shields leaving a mo erately wide naked area between them, which is not covered by minute platelet

Snout contained 1.7 (1.6) in head; interorbital 3.2 (3.3), eye 5 (4.9 Width of suborbital equal to $\frac{1}{2}$-$\frac{2}{3}$ diameter of eye. Opercular width contained 1 (1.8) in its depth. Fontanel narrow, long, beginning nearly at level of front eye, extending posteriorly about $\frac{1}{3}$ of way along center of supraoccipital. Occi ital process narrowly triangular, meeting the azygous predorsal scute, which about equals in length. Rictal barbels reaching gill opening.

Dorsal I,7, the spine contained 1.6 (1.5) in head. First three rays grea er than spine. Dorsal base slightly less than its distance from adipose. Caud damaged. Anal I,6, the first rays long. Pectoral I,9, the spine contained 1 (1.4) in the head, its base incompletely surrounded by the coracoid proces

Ground color yellow with brown markings on sides of the form shown Ellis's figure. Caudal with vertical bands, other fins immaculate.

The problem of placing the specimens described above as *Corydoras ellis* has been rather difficult. The morphological differences between these specime and *septentrionalis* are minor and unsatisfactory. They may be summarized as fo lows: in *ellisae* the interorbital is contained 3.2-3.3 times in the head and t eye 4.9-5.0; there are 11-15 retrorse points along the posterior edge of the pe toral spine; and the posterior dark blotch is below the adipose. In *septentri nalis* the interorbital is contained 2.6-3.3 times in the head and the eye 4. 4.7; there are 16-19 retrorse points along the posterior edge of the pector spine; and the posterior dark blotch is at the base of the caudal.

It can be seen at once that on morphological grounds these two forr might well be considered one species. Yet the one is found in Paraguay a the other in Venezuela, which represent nearly the southern and northern boun aries respectively of the range of the genus. Nor has anything similar to eith form been collected in the great area between. Until such a form is taken i this intermediate area it would seem preferable to consider *ellisae* and *septe trionalis* as separate species.

Corydoras flaveolus von Ihering, with which Ellis has identified thes specimens, is an inadequately described but apparently rather different speci belonging to the round-snouted group. Regan (1912) has tentatively synonymize it with *Corydoras paleatus*, and the same thing is done in this paper.

7. *Corydoras hastatus* Eigenmann and Eigenmann

Corydoras hastatus Eigenmann and Eigenmann, 1888, p. 166 (Villa Bella, on the Amazon).

Corydoras australe Eigenmann and Ward, in Eigenmann, McAtee and Ward, 1907, p. 123 (Villa Rica, Paraguay); Fowler, 1932, p. 368, fig. on p. 369 (Descalvados, Matto Grosso).

8. *Corydoras eques* Steindachner

Corydoras eques Steindachner, 1877, p. 140 (p. 92 of reprint) pl. 12, figs. 3 and 3a (Cudajas and Teffé).

9. *Corydoras elegans* Steindachner

rydoras elegans Steindachner, 1877, p. 141 (p. 93 of reprint) (Cudajas and Teffé); Regan, 1912, p. 214 (Cudajas).

Stanford 34240, one, 39 mm, vicinity of Pevas, Ampiyacu River, Peru, Aug. 3, 1936, W. G. Scherer.

10. *Corydoras ambiacus* Cope

rydoras ambiacus Cope, 1872, p. 280 (Rio Ampiyacu, Peru); Fowler, 1915, p. 232 (on types of *ambiacus* and *trilineatus*).
rydoras trilineatus Cope, 1872, p. 281, pl. 6, fig. 2 (Rio Ampiyacu, Peru).
rydoras agassizii Steindachner, 1877, pp. 138 and 234 (pp. 90 and 186 of reprint), pl. 12, fig. 2 (Tabatinga).

Stanford 33316, 33317, two, 45 and 50 mm, vicinity of Pevas, Ampiyacu iver, Peru, Dec. 22, 1936, W. G. Scherer.

These specimens resemble Cope's plate of *C. trilineatus* in general color attern, except that the black blotch on the dorsal extends on to the sides at he base of the front part of the fin. The chief morphological difference is one f length of snout, and this, according to Steindachner (1877, p. 234), differs ith the size of the individual. Under the "rule of the first reviser," the name *mbiacus* supplants that of *trilineatus*, since Fowler (1915) used the former name.

11. *Corydoras armatus* Günther

allichthys armatus Günther, 1868, p. 230, fig. 1 (Xeberos, on the Rio Huallaga).
Corydoras amphibelus Cope, 1872, p. 282 (Rio Ampiyacu, Peru).
rydoras armatus Regan, 1912, p. 215 (Rio Huallaga and Rio Jurua); Ellis, 1913, p. 406, pl. 27, fig. 3 (San Joaquin, Bolivia).

As Regan has already pointed out, *C. amphibelus* differs from *C. armatus* hiefly in having a banded rather than a plain caudal. Only a comparison of other pecimens with a banded caudal with *C. armatus* will prove whether *C. amphibelus* s valid. Such specimens have not been taken, and the type of Cope's species, hich I have examined, is in too poor a state of preservation to ascertain this oint.

12. *Corydoras aeneus* Gill

oplosoma aeneum Gill, 1858, p. 403 (Trinidad).
orydoras venezuelanus von Ihering, 1911, p. 385 (Rio Cabriales, Venezuela).
orydoras aeneus Regan, 1912, p. 218 (Granada; Trinidad; Matto Grosso; and Sara, Bolivia).
orydoras macrosteus Regan, 1912, p. 219 (Rio Piracicaba, São Paulo).

Stanford 35060, one, 30 mm, Rio Limon, a tributary of Lake Valencia, Venezuela, Dec. 30, 1937, F. F. Bond; 35061, two, 35 and 48 mm, Rio Urama, about 40 m. west of Puerto Cabello, Venezuela, Jan. 26, 1938. F. F. Bond; 35062, six, 6-38 mm, Rio Carichapo, 30 km. east of Upata, Venezuela, March 12, 1939, F. F.

Bond; 35063, two, 32-40 mm, eastern Brazil, aquarium specimens from J. P. Arnol 35064, five, 29-38 mm, aquarium specimens without locality or date.

13. *Corydoras bondi*, new species

Holotype: Stanford 35065, one, 34.2 mm, Rio Yuruari, 3 km. east of E Callao, Venezuela, March 13, 1939, F. F. Bond.

Paratypes: Stanford 35066, eighteen, 27-32 mm, Rio Yuruari, 3 km. eas of El Callao, Venezuela, March 13, 1939, F. F. Bond; 35067, ten, 31-33 mm, Ri Yuruari, at El Callao, Venezuela, March 13, 1939, F. F. Bond; 35068, six, 24-2 mm, Rio Carichapo, a tributary to Rio Yuruari, 30 km. east of Upata, Venezuela.

In the following description measurements for the holotype stand first measurements in parentheses are for ten paratypes 26-33 mm in standard length

A rather short, chunky species with blunt snout. Depth contained 2.5 (2.5 2.7) in standard length; width of body 3.5 (3.4-3.7), head to upper angle o gill opening 3.1 (3.0-3.1), distance from snout to dorsal 1.9 (1.8-2.0). Dept of caudal peduncle contained 2.3 (2.3-2.5) in depth of body. Lateral scute 22-21/20-19; three or four azygous scutes preceding adipose. Lateral line pore inconspicuous. Lateral scutes and coracoid processes leaving a wide naked are between them which is not covered with small platelets. Coracoid processes no completely surrounding pectoral bases.

Snout blunt, rounded, descending rapidly from the area forward of eye Snout contained 1.9 (1.8-2.3) in head; interorbital 2.4 (2.2-2.6), eye 3.7 (3. in smallest-3.7); postorbital area of head to upper angle of gill opening 3. (3.1-3.7). Suborbital depth equal to about half the diameter of the eye. Opercu lar width contained 1.6 (1.7-2.0) in its depth. Fontanel slightly longer tha diameter of eye, beginning above forward edge of pupil. Occipital process rath long, about twice the length of the azygous predorsal scute meeting it, its la eral borders concave. Rictal barbels short, reaching about to level of posteri margin of pupil.

Dorsal with I,7, less commonly I,8, rays, the spine contained 1.1 (1.0 1.2) in length of head. First one or two rays longer than spine. Dorsal bas somewhat longer than its distance from adipose. Caudal rather short, not deepl cleft. Anal I,6. Pectoral I,9, the spine contained 1.1 (1.0-1.1) in length o head.

Ground color yellowish. Sides with a median trilineate pattern forme of a central dark stripe bordered on either side by an unpigmented band, thes in turn delimited by the brown spotting of the remainder of the body. Centra stripe extending from the fourth scute to the caudal, becoming more intense pos teriorly. All three bands about equal to the diameter of the eye in width. Hea darker than body, with rather indefinite markings. Fins also without defini markings, except that there may be small spots on the central caudal rays o some specimens.

14. *Corydoras julii* Steindachner

Corydoras julii Steindachner, 1906, p. 480 (Parahim, the outlet of Lake Paranagua, State of Piauhy, and mouths of creeks around Victoria, State of Maranhac, Brazil).

Corydoras leopardus Myers, 1935, p. 10 (?Amazon or some coastal stream to the southward).

Stanford 35069, seven, 25-37 mm, aquarium specimens.

15. *Corydoras punctatus* Bloch

:aphractus punctatus Bloch, 1794, pl. 377, fig. 2; Bloch, 1797, p. 72, pl. 377, fig. 2 (Surinam).
:ydoras geoffroy Lacépède, 1803, p. 148 (no locality).

Bloch's species is known only from a plate and a rather poor description. ne of the more recently described species quite agree with it, though further terial from Surinam may show one of them be a synonym. For a discussion con- ning the identification of *Corydoras geoffroy*, see Prof. Myers, above, p. 11.

16. *Corydoras raimundi* Steindachner

:ydoras raimundi Steindachner, 1907a, p. 84 (Rio Parnahyba, near Victoria, State of Maranhão, Brazil).

17. *Corydoras melanistius* Regan

:ydoras punctatus (nec Bloch) Günther, p. 229 (Essequibo); Eigenmann 1912, p. 220 (in part; specimens from British Guiana lowlands).
orydoras punctatus (nec Bloch) Eigenmann and Eigenmann, 1890, p. 472 (José Fernandez, near Manáos).
:ydoras melanistius Regan, 1912, p. 216 (Essequibo); Myers, 1927, p. 126 (British Guiana lowlands and Caño de Quiribana, near Caicara, on the Orinoco).

I have examined the Venezuela specimens recorded by Myers.

18. *Corydoras paleatus* Jenyns

:llichthys paleatus Jenyns, 1842, p. 113 (no locality).
:ydoras marmoratus Steindachner, 1879, p. 26, pl. 5, fig. 1 (Montevideo and La Plata).
:ydoras ehrhardti Steindachner, 1910, p. 60 (Joinville, State of Santa Catharina, Brazil).
orydoras meridionalis von Ihering, 1911, p. 381 (Colonia Hansa, State of Santa Catherina, Brazil).
orydoras nattereri triseriatus von Ihering, 1911, p. 386 (Rio Doce, State of Espirito Santo, Brazil).
orydoras flaveolus von Ihering, 1911, p. 386 (Rio Piracicaba, State of São Paulo, Brazil).

Stanford 31579, thirteen, 32-54 mm, Chaco, Argentina, T. L. Marini; 31580, ny, 24-66 mm, San Pedro, Argentina, June, 1934, A. W. Herre; 31581, seventeen, -35 mm, Corrientes, Argentina, T. L. Marini; 35070, many, 22-49 mm, aquarium ecimens.

Of the species that have been placed in synonymy, *C. marmoratus* without any ubt belongs here, *C. ehrhardti* is placed here because Regan has examined the types of the species and considers them indistinguishable from *C. paleatus*, ile von Ihering's three species must be at present considered unidentifiable rms which may or may not belong here.

19. *Corydoras garbëi* von Ihering

Corydoras garbei von Ihering, 1911, p. 382 (Rio São Francisco); Ellis, 1913, p. 409, pl. 28, fig. 2 (Joazeiro, Lagoa Pereira and Barreiras, Rio São Francisco).

It is perhaps worth pointing out that Ellis's figure of this fish lack the blotch on the dorsal described by von Ihering.

20. *Corydoras multimaculatus* Steindachner

Corydoras multimaculatus Steindachner, 1907b, p. 291 (Rio Preto, State of Minas Geraes, Brazil; Ellis, 1913, p. 411, pl. 29, fig. 4 (Rio Preto).

21. *Corydoras aurofrenatus* Eigenmann and Kennedy

Corydoras aurofrenatus Eigenmann and Kennedy, 1903, p. 507 (Aguada, Paraguay); Eigenmann, McAtee, and Ward, 1907, p. 123, pl. 28, fig. 4 (Villa Rica, Paraguay).

22. *Corydoras microcephalus* Regan

Corydoras microcephalus Regan, 1912, p. 211 (La Plata).

23. *Corydoras micracanthus* Regan

Corydoras micracanthus Regan, 1912, p. 211 (Salta, Argentina).

24. *Corydoras melanotaenia* Regan

Corydoras melanotaenia Regan, 1912, p. 217 (Honda, Colombia); Eigenmann, 1922, p. 228, pl. 8, fig. 1 (Rio Meta basin).

Stanford 32080, one, 37 mm, Guaicaramo, Province of Meta, Colombia, Brother Apolinar Maria.

25. *Corydoras macropterus* Regan

Scleromystax barbatus (nec Quoy and Gaimard) Ellis, 1913, p. 385, pl. 25, figs. 1 and 2 (Iguapé, State of São Paulo, Brazil).
Corydoras macropterus Regan, 1913, p. 232 (Paranagua, State of Paranagua, Brazil).

In order to make certain of the status of *Scleromystax*, I have borrowed specimens of what Ellis considered to be that genus from the Carnegie Museum. The identity of these specimens is dealt with under the discussion of the generic name *Corydoras* (see page 11).

26. *Corydoras arcuatus* Elwin

Corydoras arcuatus Elwin, 1939, p. 126, pl. 3 (?Teffé).

Stanford 35071, two, 34 and 35 mm, 1939, aquarium specimens said to be om Teffé. These formed part of the shipment from which Miss Elwin's types came, d were given to the museum through the kindness of Mr. W. T. Innes.

27. *Corydoras metae* Eigenmann

orydoras metae Eigenmann, 1914, p. 230 (Barrigona, Rio Meta, Colombia); Eigenmann, 1916, p. 78, pl. 14, fig. 1 (on the type specimen).

28. *Corydoras melini* Lönnberg and Rendahl

orydoras melini Lönnberg and Rendahl, 1930, p. 1, fig. 1 (Jauaraté, Rio Uaupes, State of Amazonas, Brazil).

This species is very closely related to the last and may prove to be a olor variation of it.

29. *Corydoras potaroensis* Myers

orydoras punctatus (nec Bloch) Eigenmann, 1912, p. 220 (in part), pl. 24, fig. 3 (specimens from Erukin and Potaro Landing, British Guiana).
orydoras potaroensis Myers, 1927, p. 126 (Erukin and Potaro Landing, British Guiana).

Stanford 21974, two, 31 and 35 mm, Potaro Landing, British Guiana, 1908, igenmann.

Measurements for the larger specimen: width of body 4.0, head 3.0 in standrd length. Snout 1.9, eye 3.0, interorbital 2.8, and dorsal spine 1.2 in head. uborbital narrow. Coracoids incompletely enclosing pectoral bases on the surface f the body and leaving a wide fleshy area between them on the abdomen. Scutes 3/21; 4 azygous pre-adipose scutes. This species is well figured by Eigenmann.

30. *Corydoras nattereri* Steindachner

'orydoras nattereri Steindachner, 1877, p. 143 (p. 95 of reprint), pl. 11, fig. 1 (Rio de Janeiro); Regan, 1912, p. 219 (Rio de Janeiro).
'orydoras juquiae von Ihering, 1907, p. 36 (Rio Juquia, São Paulo).

Corydoras juquiae is here placed in synonymy following Regan, who has exmined co-types of the species.

31. *Corydoras microps* Eigenmann and Kennedy

orydoras microps Eigenmann and Kennedy, 1904, p. 507 (near Rio Branco, Matto Grosso, Brazil, and three localities in Paraguay); Eigenmann, McAtee, and Ward, 1907, p. 123, pl. 28, figs. 2 and 3 (Sapucay and Villa Rica, Paraguay).
'orydoras undulatus Regan, 1912, p. 217 (La Plata).

I can see no reason for Regan's contention (1912, p. 217) that the speies described by Eigenmann and Kennedy is other than that figured by Eigenmann, IcAtee, and Ward.

32. *Corydoras latus* Pearson

Corydoras latus Pearson, 1924, p. 19, pl. 3, fig. 1 (Lake Rogoagua, Bolivia).

33. *Corydoras polystictus* Regan

Corydoras polystictus Regan, 1912, p. 216 (Descalvados, State of Matto Grosso, Brazil); Fowler, 1932, p. 368, fig. on p. 369 (Descalvados, State of Matto Grosso, Brazil).
Corydoras virescens Miranda Ribeiro, 1912, p. 16 (São Luis de Caceres, State of Matto Grosso, Brazil); Ellis, 1913, p. 405, pl. 27, fig. 2 (Rio Paraguay and Rio Guaporé).

VIII. Genus *BROCHIS* Cope

Brochis Cope, 1872, p. 277 (genotype *Brochis coeruleus* Cope by subsequent designation of Eigenmann and Eigenmann, 1890, p. 463).
Chaenothorax Cope, 1878, p. 679 (genotype by original designation *Chaenothorax bicarinatus* Cope).

Body and head compressed. Eye more or less superior. Lower lip forming a single pair of short barbels (fig. 3) in addition to the rictal barbels, the latter never reaching much beyond level of gill opening. Fontanel elongate. Supraoccipital forming a projection which extends along the midline towards an azygous predorsal plate. Nuchal plates never meeting along the mid-dorsal line. Coracoids exposed on the abdomen between the pectoral fins. Dorsal I,10 to I,12, usually I,11 or I,12, its base considerably longer than its distance from the adipose. Caudal forked.

It should be mentioned that the barbels of this genus are similar to those of *Corydoras*. The peculiarities mentioned by Cope are again undoubtedly due, as in *Dianema*, to decay of the flesh behind the lips of Cope's specimens. Two species; Amazon and Paraguay respectively.

KEY TO THE SPECIES

1a. Depth of body 2.2-2.4, width of body 3.6-4.2 in standard length; 22-23 scutes in upper lateral series; no naked area on the dorsum in front of adipose fin. .....1. *B. coeruleus.*
1b. Depth of body 2.7, width 5 in standard length; 24 scutes in upper lateral series; a naked area between the scutes on the dorsum in front of the adipose.....2. *B. eigenmanni.*

1. *Brochis coeruleus* Cope

?Callichthys splendens Castelnau, 1855, p. 39, pl. 18, fig. 3 (Rio Tocantins).
Brochis coeruleus Cope, 1872, p. 277, pl. 7, fig. 2 and pl. 9, fig. 3 (Rio Ampiyacu, Peru).
Brochis dipterus Cope, 1872, p. 278 (Rio Ampiyacu, Peru).
Corydoras semiscutatus Cope, 1872, p. 280 (Rio Ampiyacu, Peru).
Chaenothorax bicarinatus Cope, 1878, p. 679 (Peruvian Amazon).
Chaenothorax semiscutatus Cope, 1878, p. 680 (Rio Ampiyacu, Peru).

Stanford 33296-33304, nine, 46-61 mm, Pevas district, Rio Ampiyacu, Peru, 36 and 1937, W. G. Scherer.

Body and head compressed throughout; width of body 3.6-4.2 in standard ngth, depth 2.2-2.4. Lateral scutes 22-23 in the upper series, the fourth wider an the rest; 21-22 in the lower lateral series. One or two azygous scutes pre- ding adipose. Lateral scutes leaving a very narrow naked area between them ntrally from the ventrals to the anal, none dorsally in front of the adipose. ields at pectoral bases meeting at the midline ventrally in the adult but aving a space in younger specimens.

Head to upper angle of gill opening contained 2.7-3.0 times in the stand- d length, its dorsal profile nearly straight except for a hump in front of the e. Suborbital region and all of head except lower third of snout enclosed in ne. Suborbital expanded forward, its depth there about equal to the diameter the eye. Occipital process rounded posteriorly, meeting the azygous predorsal ate. Snout contained 1.7-1.9 times in length of head, fontanel 2.6-3.4. Eye tuated high in head, slightly above the level of the union of the two series of teral scutes; diameter of bony orbit 3.5 (in a 46-mm specimen) to 4.0 (in a 60- specimen) times in head. Interorbital convex, its width 2.0-2.2 times in head. uth small, slightly overhung by snout. Rictal barbels two, subequal, reaching ightly beyond eye. A single pair of short barbels extending backward from the wer lip.

Dorsal spine nearer snout than caudal, its distance from snout 1.8-1.9 in andard length. Dorsal I,11 or I,12, the spine smooth in front, rough behind, ightly shorter than first rays, 1.4-1.7 in head. Length of dorsal base 1.1-1.2 head. Last dorsal rays reaching to or beyond origin of adipose. Adipose spine ll developed; membrane present, truncate behind. Anal I,7, the spine not pun- nt, rough anteriorly, shorter than the first rays. First anal rays reaching rther posteriorly than the last. Pectoral I,9, tapering rapidly from the first the last ray. Pectoral spine smooth forward, rough behind, its length con- ained 1.1-1.2 times in head. Ventrals I,5. Caudal forked, the upper lobe the nger.

Color in alcohol metallic blue above, yellow below, a narrow light stripe xtending ventrally from the dorsal spine. Adipose membrane with a dark poste- ior margin; other fins plain.

Callichthys splendens must for the present be considered an unidentifi- le species. The type of suborbital which is depicted in Castelnau's plate of his fish is characteristic of both *Brochis coeruleus* and *Corydoras aeneus*. It placed doubtfully with the former because of the great length of the dorsal ase. *Corydoras semiscutatus* is based on specimens in which the coracoids cover ne breast less completely; this may be due either to immaturity or to sexual imorphism. *Chaenothorax bicarinatus* resembles *Corydoras semiscutatus* in the ack of coracoid expansion, and it is this character on which the genus *Chae- othorax* is based.

I have examined the types of all the species described by Cope in the bove synonymy except *Brochis dipterus*, which I was unable to find in the Phila- elphia Academy collection. It is perhaps worth noting that the type of *Cory- oras semiscutatus* has the snout and dorsal rays missing and that that of *Chae- othorax bicarinatus* is green and somewhat shrivelled. It is most probable that hese specimens were in this condition when Cope received them.

2. *Brochis eigenmanni* Ellis

?Callichthys taiosh Castelnau, 1855, p. 39, pl. 19, fig. 1 (Chiquitos, State of Matto Grosso, Brazil).

Brochis eigenmanni Ellis, 1913, p. 393, pl. 26, fig. 2 (São Luis de Caceres, Sta of Matto Grosso, Brazil).

Callichthys taiosh is known only from Castelnau's copy of Weddell's plate The species is placed in doubtful synonymy here because of a general similarit of appearance and contiguity of type localities.

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THREE NEW BLENNOID FISHES FROM THE WEST COAST OF MEXICO

By Vernon E. Brock[1]

These species were collected by the author during the past winter while gaged in a study of the shallow water ichthyological fauna of the West Coast of xico. Species of two genera are described, and it has been thought best to in- ude keys to the Pacific Coast representatives of both these genera.

With the exception of *Acanthemblemaria balanorum*, these species were all ken with the aid of diving apparatus and fish poison in depths between 15 and 35 et. *A. balanorum* was taken with the aid of water goggles by skin diving around a cky islet. The collections obtained by these methods are from a region difficult access by ordinary means, which is, therefore, not well known. The small fishes ich live on the bottom and in holes and cracks are particularly easy to capture ith fish poison and the aid of diving apparatus.

Genus *ACANTHEMBLEMARIA* Metzelaar

canthemblemaria Metzelaar, Over Tropisch Atlantische Visschen, 1919, p. 159 (type by monotypy, *A. spinosa* Metzelaar).
remblemaria Longley, Carnegie Institution of Washington, Year Book No. 26, 1927, p. 222 (type by monotypy, *P. aspera* Longley).

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It may be mentioned that Longley (Carnegie Institution of Washington, Y Book No. 30, 1931, p. 385) has synonymized *A. arborescens* Beebe and Tee-Van and *aspera* Longley with *A. spinosa* Metzelaar. In 1933 (Carnegie Institution of Wa ington, Year Book No. 32, 1933, p. 294) Longley places *A. variegata* Beebe and Te Van in synonymy with *A. spinosa* Metzelaar and indicates that the differences are these nominal species are sexual. According to Longley this leaves only a sing species of this genus recorded from the Caribbean.

KEY TO EASTERN PACIFIC SPECIES OF *ACANTHEMBLEMARIA*

1a. Tips of spines on upper surface of head and interorbital region forming a co vex covering, with a very narrow spineless area down middle, forming a deep median longitudinal trough; no flaring plate jutting outward and upward on dorso-posterior border of orbit, the circum-orbital series of spines regular at this place; depth of head 1.4 to 1.6 in its length measured to upper angl of gill opening.....*A. balanor*

1b. Tips of spines on interorbital and the interorbital part of cranium forming strongly depressed, concave surface with a wide, open, spineless groove down the middle; a more or less evident bony, flaring plate jutting outward and upward on dorso-posterior border of orbit, bearing serrations or spines on its edge; depth of head 1.6 to 1.9 in its length.

2a. Flaring plate not pronounced, serrations not strong but rounded; spines on head small and blunt; head darker than rest of body; no oval, conspicuous, black-margined, brownish spot on preopercle; no pale spots surrounded with darker on body; head depth 1.6 to 1.75 in its length.

3a. Body with more than two longitudinal rows of dark brown spots, two main rows with spots as large as eye in front but diminishing rapidly posterior ly; upper row at base of dorsal, lower at midline of body, with other long tudinal rows of smaller brown spots between; dorsal XXII to XXIII, 13 to 14; anal II, 24 to 25; depth of head 1.75 in head length.....
.....*A. hancocki hancocki*

3b. Body with two main longitudinal rows of large brown spots, larger than eye and interspaces forward; upper row at base of dorsal, lower at midline; no other longitudinal rows of smaller brown spots; dorsal XXIII to XXIV, 12 t 14; anal II, 25 to 27; head depth 1.6 to 1.7 in its length.....
.....*A. hancocki macrospilus*

2b. Flaring plate on dorso-posterior border of orbit pronounced and composed of adjoining spines; spines on head large and sharp; an oval, conspicuous, black-margined, brownish spot on preopercle; body, in preservative, with pale spots surrounded with darker; head depth 1.9 in its length.....
.....*A. crocker*

Acanthemblemaria balanorum, new species

Holotype: Stanford Natural History Museum No. 35046; a specimen 46.6 mm i standard length taken January 31, 1940, at Cape San Lucas, from an empty, at tached barnacle shell on a small, rocky islet in three or four feet of water.

Paratypes: Stanford Natural History Museum No. 35047, two specimens 37.8 and 35.5 mm in standard length, same data as holotype.

Dorsal XXIV, 13. Anal II, 25 to 26. Pectoral 13. Pelvic 3. Caudal 20. Body moderately elongate, trunk compressed, greatest depth at origin of pectora Upper profile of head continuously decurved from dorsal fin to end of snout, arc

rofile like quarter part of circle. Head 3.9 to 4.2 in standard length, depth
to 5.5, predorsal distance 7.2 to 8.2, preanal distance 2.2 to 2.3. Depth of
1.4 to 1.6 in head (measured to upper angle of gill opening), pectorals 1.4
.5, pelvics 1.9, caudal 1.6 to 1.7, snout 7.1 to 8.8, interorbital 3.7 to
maxillary 1.8, extending well past posterior rim of orbit to a vertical from
in of dorsal.

Teeth in upper jaw in a single, strong, outer row which extends backward
pposite middle of palatine patch; and a series of fine inner teeth. Vomer
six strong teeth, three on a side, middle one smaller and directed outward.
atine patches with two rows of teeth, the patches being elongate in shape.
h of lower jaw in a single, strong outer row, with patch of small teeth be-
main ones at front of jaw. Jaws are expanded in front and constricted behind
as Myers and Reid describe for *hancocki*, like the jaws of *Hippopotamus*. Front
h of both jaws flattened and flared outward slightly; other main teeth stout
conical.

All of front of upper part of head forward of the vertical of the poste-
rim of orbit thickly covered with blunt spines, which give the interorbital
onvex appearance; a spiny patch extending within a millimeter of origin of
sal in holotype; a very narrow, median, spineless trough from tip of nose over
of head, this trough about one half mm wide in holotype. Circumorbital se-
s of spines fairly regular, posterior rim of orbit free of spines, a row of
es immediately behind rim. Supraorbital tentacles simple with bifid tip, 1.3
eye. Nasal tentacles shorter and trifid. Row of pores from top of gill open-
to origin of dorsal, five on a side; another row of eight or nine pores along
e of preopercle. Opercle ends with membranous flap supported by branchiostegal
s which reach above point of attachment of gill cover.

Vertical fins of moderate height, soft rays longer than spines, last rays
joined to caudal. Origin of dorsal directly at base of cranium, well ahead of
opercle. Pelvics forward of pectoral base and just behind tip of opercle.

Spinous area on head is as dark as markings on sides; a faint spot behind
area, extending downward on preopercle. Isthmus and branchiostegals dark.
y olive gray with two dark brownish, blotchy bands on sides, first immediate-
below dorsal, second along midline; a row of spots on dorsal base, these merg-
with upper lateral band, which is broken into spots posteriorly. Spots not
ll; mostly larger than eye. Spinous dorsal and anterior two thirds of anal
ckish, the distal ends of the rays darkest. Pelvics blackish. Pectoral, cau-
, and soft dorsal clear, a very faint marginal band on soft dorsal. Markings
d to disappear in preservative, leaving body olive gray with few faint blotch-
on sides.

This species evidently ascends into the barnacled intertidal area with the
oming tide; all specimens obtained were captured by trapping the fish within
empty barnacle shell by placing a finger over the opening of the shell, then
ving the barnacle from the rocks. Examples were observed resting quietly with-
barnacle shells, their heads protruding, and any disturbance would cause them
retreat entirely within the shell. Very short excursions might be made away
m a safe hiding place, but the fish were very alert and quick to return to a
ce of safety. Commonly, they would quickly slide one half or two thirds of the
ly clear of the retreat to pick up food, which was invisible to the observer.
eyes seemed to be always in motion, watching the drift of food past the re-
at, or the approach of any larger object.

Acanthemblemaria hancocki macrospilus, new subspecies

Holotype: Stanford Natural History Museum No. 35048, a specimen 35.0 mm standard length, taken Feb. 16, 1940, at Magdalena Island, the middle island Tres Marias group, off the West Coast of Mexico, by fish poison in 30 feet water.

Paratypes: Stanford Natural History Museum No. 35049. Two specimens 22 mm and 19.0 mm in standard length, taken January 31, 1940, at Cape San Lucas, fish poison in 15 feet of water.

Dorsal XXIII to XXIV, 12 to 14. Anal II, 26 to 27. Pectoral 13. Caudal 1 Body moderately elongate, trunk compressed, greatest depth at origin of pectora Upper profile of head sharply curved, snout almost vertical. Head 3.4 to 3.9 standard length, depth 4.9 to 5.1, predorsal distance 5.9 to 6.4, preanal dis tance 2.0 to 2.1. Depth of head in head length (measured to upper angle of gi opening) 1.6 to 1.7, pectorals 1.4 to 1.7, pelvics 1.7 to 2.3, caudal 1.7 to 2. snout 5.3 to 5.6, interorbital 4.7 to 5.8, eye 3.2 to 3.75, maxillary 1.8 to 2. extending well beyond posterior rim of orbit.

Teeth in upper jaw in a single, strong outer row which extends backwar opposite middle of palatine patch; and a series of fine inner teeth. Vomer wi six conical teeth, three on each side, the middle one smaller and set furthe out. Palatine patches with two rows of teeth, the patches being elongate shape. Teeth of lower jaw in single, strong, outer row with patch of fine tee behind at forward part of jaw. The jaws have the *Hippopotamus*-like shape, simi lar to that described for other members of this genus.

The spinous covering of the upper part of the head is like that describ for *A. hancocki hancocki*. The supraorbital and nasal tentacles are closely sim lar to those of *A. hancocki hancocki*.

The head back to insertion of pectorals is black in holotype, not as dar in smaller specimens. Isthmus is dark brown, in contrast to throat which is li straw color. Four or five squarish-oval brownish spots in longitudinal ro on midline of body reaching to caudal fin, six or seven spots on sides at base dorsal fin encroaching a little on fin membranes and extending most of length fin; both rows of spots on anterior part of body larger than interspaces and eye No other spots on body. A conspicuous black spot on forepart of dorsal, reach ing to tip of first dorsal spine, and covering basal half of first six spines the fin above this white in preservative, brilliant orange in life. Anal spine with a narrow, black, punctulate band, just inside tips of spines. Other verti cal fins clear; pectoral base dark, distal part of rays clear; pelvics brownish

The chief differences between the new form and *hancocki hancocki* lies the coloration. *A. h. macrospilus* does not show an hour-glass-shaped saddle se transversely across occiput as conspicuously as *hancocki hancocki*, since the hea and occipital region is much darker especially in the larger specimens. The spot on the body are much coarser and fewer in *macrospilus*, and the dorsal and ana fin counts appear to be a little higher, although over-lapping occurs in thi character. *A. h. macrospilus* appears to have a little blunter head than *hancocki*. The range of *macrospilus* is more northern, specimens here described being fro Cape San Lucas and the Tres Marias Islands, and *macrospilus* may be regarded as a northern offshoot of *hancocki*, which was originally taken at the Secas Islands, Pacific Coast of Western Panama.

A. hancocki macrospilus was found in some abundance on a coral reef in 3 feet of water, on the southeast corner of Maria Magdalena Island, one of the Tres

as group. Although the species would, if disturbed, quickly enter any con-
ent crack or hole, the fish were much less wary than *A. balanorum*. This spe-
is similar to *Enneapterygius carminalis* in habitat and the two were taken
ther, with poison.

Genus *ENNEAPTERYGIUS* Rüppell

apterygius Rüppell, Neue Wirbelthiere, Fische, 1835, p. 2 (type by monotypy,
pusillus Rüppell).
anectes Jordan and Evermann, Proc. California Acad. Sci., 2nd ser., vol. 5,
95, p. 501 (type by monotypy, *Tripterygium carminale* Jordan and Gilbert).
ias Evermann and Marsh, Report U. S. Fish Comm., vol. 25 (for 1899), 1900,
357 (type by monotypy, *G. jordani* Evermann and Marsh).

KEY TO AMERICAN MEMBERS OF THE GENUS *ENNEAPTERYGIUS*

Four or five scale rows between lateral line and base of first dorsal fin;
supraorbital tentacle slender; 12 to 17 rows of scales around caudal pedun-
cle.
Dorsal III-XI-9; anal II,17; five scale rows between lateral line and base
of first dorsal fin; 17 scale rows around caudal peduncle; dorso-anterior
portion of orbit expanded into an outwardly projecting plate without spines
or serrations on edge. (Cape San Lucas).....*E. storeyae.*
Dorsal III-XIII to XV-13 to 14; anal II,21; four scale rows between lateral
line and base of first dorsal fin; 12 scale rows around caudal peduncle;
dorso-anterior portion of orbit with small spines on edge. (Galapagos Is-
lands).....*E. corallicola.*
Three rows of scales between the lateral line and base of first dorsal fin;
supraorbital tentacle broad with lobed end; 8 to 11 rows of scales around
caudal peduncle.
Soft dorsal with nine rays. (West Coast of Mexico.).....*E. carminalis.*
Soft dorsal with seven rays. (Caribbean.).....*E. jordani.*

Enneapterygius storeyae, new species

apterygius carminalis Brock, Copeia, 1938, no. 3, pp. 128-131 (not of Jordan
d Gilbert, 1881).

Holotype: Stanford No. 35045, 24.3 mm in standard length. Taken at Los
les, Cape San Lucas, Lower California, March 2, 1938. Caught in widemouthed
by the author in diving helmet in 15 feet of water.

Dorsal III-XI-9. Anal II,17. Pectoral 15. Pelvic 2. Caudal 15. Lateral
34 to 35, five rows of scales between lateral line and base of first dorsal.
short and cottid-like, greatest depth at origin of pectorals. Profile little
ded, eyes high up and close together. Head 3.3 in standard length, depth 4.4,
orsal distance 4.1, preanal distance 2.1, pectorals 2.7, pelvics 6.1. Snout
in head length (measured to extreme edge of bony opercle), eye 3.4, interor-
l 7.4, maxillary 2.5, caudal 1.6.

Supraorbital tentacle thin and dark, nasal tentacle slender and clear.
tal ring with fine spines on posterior half, two rows on posterior ventral

quarter; anterior half spineless and expanded into a flaring plate with two po on antero-dorsal aspect; outer edge of plate smooth. Preopercle with fine spi on edge; opercle ends with membranous flap supported by branchiostegal rays wh reach nearly to point of attachment of gill cover. Portion of bony opercle mediately below point of attachment bears a row of spines along edge.

Vertical fins moderate in height, second dorsal highest, soft dorsal ne Origin of first dorsal close to base of cranium directly over preopercle. Ori of pelvics forward of pectoral base.

Single row of large, hooked teeth in upper jaw, with patch of fine te behind. Palatine and vomerine teeth numerous and fine. Lower jaw with a sin row of large, hooked teeth, and smaller teeth behind at front of jaw.

Upper lip and snout punctulate with small dark spots, which extend to d sal surface of head. Cheeks without markings. First dorsal dark; other verti fins, pectorals, and pelvics clear. Faint dusky cross band at origin of sec dorsal, another double band on side, opposite middle of second dorsal, third t at origin of soft dorsal. Caudal peduncle and caudal fin black.

Named for Miss Margaret Storey, who called my attention to the differen in squamation between this species and *E. carminalis*.

The holotype of *E. storeyae* was taken on a sea-fan in some fifteen feet water, by clapping a widemouthed jar over the sea-fan and pulling it loose wi in the jar. Other specimens were seen at this locality also, on and about s fans. *E. carminalis*, at the Tres Marias Islands, is usually found about ro places (specimens were taken there in 25 and 30 feet of water on a bottom of d al and rock) but was not especially associated with sea-fans.

Remarks

Tripterygium carminale was described from Mazatlan by Jordan and Gilb (Proc. U. S. Nat. Mus., vol. 4, 1881, p. 357) from four specimens. Dr. L. Schultz has informed Dr. Myers that these specimens are not to be found in t National Museum, and it is likely that they were lost in the fire of 1883 Bloomington (see Stanford Ichth. Bull., vol. 1, no. 5, 1940, p. 163). The ori nal description can be interpreted to agree with either the species called *E. carminalis* or *E. storeyae*. In 1895 ("Fishes of Sinaloa"), Jordan figure small specimen (Plate 53) which he identified as *E. carminalis*, and which likewise taken at Mazatlan. This specimen has the type of squamation here signed to *E. carminalis*, and, although no supraorbital tentacle is shown in figure, the specimen from which the drawing was made has a broad, lobed, sup orbital tentacle. It is very easy to overlook both the supraorbital and na tentacles, especially with a specimen as small as this, and it is likely t Jordan and Gilbert's original material was the fish here called *carminalis*. order to place the name *carminalis* (in the absence of types), I hereby de nitely identify Jordan and Gilbert's fish with the specimen recorded by Jor (1895), and designate this example as the neotype of *carminalis* (Stanford 385

E. jordani is quite close to *E. carminalis*. Regan reported *E. carmina* from the Caribbean (Ann. & Mag. Nat. Hist., ser. 8, vol. 2, 1908, pp. 222-22 It is probable that he had *E. jordani*, or possibly a new species that agreed w the incomplete original description of *E. carminalis*.

The American members of the genus *Enneapterygius* seem to have, without ception, some scales on the head and more especially on the upper part of operculum. This does not seem to be true of the other members of the genus t

ere available for examination, nor is it indicated in Rüppell's figure of the enotype (Taf. I, fig. 2). The Australian species assigned to *Gillias* by McCulloch and others apparently also have scaled heads, although they may not, of ourse, be congeneric with *E. jordani*. If this character is, however, of generic ank, *Enneanectes* must replace *Enneapterygius*, and, of course, *Gillias*, for hese American species.

UPPRESSION OF SOME PREOCCUPIED GENERIC NAMES OF FISHES (*KESSLERIA, ENTOMOLEPIS, PTERODISCUS* AND *NESIOTES*), WITH A NOTE ON *PTEROPHYLLUM*

By George S. Myers

The appearance of the third volume of Neave's "Nomenclator Zoologicus" as made it seem worthwhile to check over the current generic names of South merican fresh-water fishes. Two of them now in common use have proved to be preccupied, and three other apparently preoccupied fish names now current have been oted in passing. Of these five names, only two need replacement with new names t the moment.

Kessleria Boghdanov 1882 (Obzor Eksp. Aralo-Kasp., 1720-1874, vol. 2, . 3; type by monotypy *Scaphirhynchus fedtschenkoi* Kessler 1872) was published ithout description, but is available under the International Rules of Zoological omenclature because it had a described type species. It seems to be preoccupied, owever, by *Kessleria* Nowicki 1864, a lepidopteran. This causes little confusion, owever, since Berg and other Russian ichthyologists have refused to use *Kessleria* on the basis that it was a nomen nudum until defined by Jordan in 1905. The entral Asiatic shovelnose sturgeons will therefore continue to be known under he generic name *Pseudoscaphirhynchus* Nikolski 1900.

Entomolepis Eigenmann 1918 (Mem. Mus. Comp. Zool., vol. 43, p. 63; type by riginal designation *Tetragonopterus steindachneri* Eigenmann 1893) is preoccupied y *Entomolepis* Brady 1899 (Trans. Zool. Soc. London, vol. 15, p. 48), a crustaean. I propose the substitute name *Bario* for the fish genus. The genotype and nly species is *Bario steindachneri*, a Characid fish from the Amazon. The new ame, to be declined Bario, Barionis, is a coined name without significance.

Pterodiscus Eigenmann 1909 (Ann. Carnegie Mus., vol. 6, p. 12; type by riginal designation *P. levis* Eigenmann 1909) is preoccupied by *Pterodiscus* ilsbry 1893 (Man. Conchol., [2] vol. 9, p. 36). However, I have examined specens of Eigenmann's genus and believe it to be a synonym of *Gasteropelecus* (Grow) Scopoli 1777. The name should not be replaced.

Nesiotes De Vis 1884 (Proc. Linn. Soc. New South Wales, vol. 8, p. 453; ype by monotypy *Nesiotes purpurascens* De Vis 1884), a name in current use for a enus of Serranidae (Pseudochromidinae), seems to have pursued the present riter. He has pointed out (Myers, Copeia, 1932, no. 1, p. 30) the confusion with *esiotes purpurascens* of another Melanesian Pseudochromid, by McCulloch, and renamed McCulloch's species. He was called upon to assist in the redescription of *esiotes* by Dr. Herre in 1936 (Field Mus. Nat. Hist., Zool. Ser., vol. 21, p. 65). Now he finds that De Vis's generic name is thrice preoccupied, by Martens 860 (a mollusk), by Wollaston 1861 (a beetle) and by Staal 1873 (a bug), and he ere proposes the substitute name *Cypho* (a hunchback) for it. There is but a ingle species, *Cypho purpurascens*, the genotype, which is known only from the eefs of the New Hebrides.

According to Neave, the fish name *Pterophyllum* Heckel 1840 (Ann. Wiener Mus., vol. 2, no. 3, p. 334; type by monotypy *Platax scalaris* Cuvier and Valenciennes = *Zeus scalaris* Lichtenstein) would appear to be preoccupied by *Pterophyllum* Harris 1833, a variant spelling of *Pterophylla* Kirby 1825 (Zool. Journ., vol. 1, p. 432). The variant spelling is said to occur in Harris's insect list in the second (1835) edition of Hitchcock's "Report on the Geology of Massachusetts," p. 582. I have looked up this work and find that in both the first (1833) and second (1835) editions of Hitchcock, Harris consistently used the spelling *Pterophylla*, and Neave's reference is therefore in error. The later editions of Hitchcock contained no insect lists. The well-known Amazonian Cichlid fish therefore will continue to be known as *Pterophyllum scalare* (Lichtenstein). It is to be noted that Lichtenstein described the species about 1823 and therefore before Cuvier and Valenciennes, in one of the Berlin Museum Catalogues, though I do not at the moment have access to the original description.